Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE DESTINY OF MAN

The purpose of this essay is to discuss the future of the human race upon this planet. Though all attempts to forecast the future must contain much of the speculative; yet in certain particulars, modern science leads to very definite conclusions about the future. If we cannot prophesy with certainty, we can, at least in some matters, base reasonable expectations upon a firm foundation of accepted scientific principles. There is nothing of such intensely practical interest as the immediate future, and perhaps nothing of such purely academic interest as the very distant future. In the intermediate region, interest passes gradually from the practical to the academic. All men have a practical interest in the morrow; provident men have a practical interest in the future of a few centuries. It is with this future of centuries, or a few milleniums, that this essay has most concern; but it will be appropriate to begin with a few words about the very remote future, as it is desirable to keep the ultimate end somewhat in mind while discussing the near future.

That there will be an ultimate end of the present order of things, physical science indicates very clearly. The sun is continually giving out heat. Heat is a form of energy, and, as such, cannot be created out of nothing. Solar heat is produced mostly by transformation of the internal energy of the sun. When all of this energy has been used up, there will be nothing to maintain solar heat, and the sun will become cold. This will leave our planet in darkness, except for starlight, and its temperature will fall very nearly to absolute zero. The atmosphere will not only condense and fall like rain, but will freeze solid. Under such conditions all life, as we know it, must cease. It has been estimated that the present rate of loss of solar heat will cool the sun to dull redness in about ten million years. Science cannot entertain the possibility of any inventions which will enable man to cope with such conditions and prolong his present kind of existence after the cooling of the sun. The difficulties in the way are fundamental; the problem would require the creation of energy out of nothing, and would thus be essentially the same as that of the so-called "perpetual-motion machine".

How nearly certain may we be of the correctness of this forecast of the remote future? We cannot be certain of it at all. Science shows that at the present time the solar system is gradually approaching the condition outlined above. It is natural to expect that the present tendencies will continue and ultimately realize an age of frozen air. But science also indicates the possibility of interruption to the present trend of decline. Shooting stars or meteorites are small masses of matter which plunge into the earth's atmosphere from outer space with velocities of several miles per second. So great a velocity represents a large amount of energy per pound of matter; this energy can be converted into heat, and is so converted when the shooting star strikes the upper atmosphere. The quantity of heat brought to the earth in this manner is insignificant, for the reason that the mass of the meteorites is insignificant. If a sufficiently large meteorite, say one as large as the moon, should bump into the earth, the heat produced would be sufficient to reduce the earth to its original molten condition. If the sun should come into collision with a meteorite of its own size, that is to say, with another star, it would be raised to such enormous brilliancy that it would parch and wither every living thing upon the earth and cause the ocean to boil away into steam. There is abundant reason to believe that outer space contains meteorites or "dark stars of enormous size." Astronomers have frequently seen new stars appear where there had been none before; or old stars suddenly increase several magnitudes in brilliancy. In such cases we suppose that a collision has taken place. There is no reason why our sun should not be one of the parties in such a collision, as well as some other star. But the probability of such an occurrence in any given year is exceedingly slight. A succession of meteorites of proper size, impinging upon the sun, could enable it to maintain its present rate of radiation indefinitely. But it is hardly conceivable that the succession would be adjusted exactly so as to avoid too great heat on the one hand and to great cold on the other. Even if such a condition should obtain throughout all eternity, it would increase the size of the sun until it would eventually reach and engulf the earth. As regards the very remote future, then, science gives us ample reason to expect the decay or destruction of our planet, as we know it, in the course of some millions of years. It indicates the possibility of destruction at any time, at comparatively short notice, since the approach of a dark star, destined to collide with the sun, could not be detected more than a few years in advance.

I propose now to drop the subject of the very remote future, and discuss probable changes that humanity will have to face in the next few thousand years. A noteworthy attempt to forecast the future of our race on earth has been made by John Fiske, in his book *The Destiny of Man.* His views are very optimistic. He calls attention to the great advance of human intellect and morality which have accompanied the race's gradual mastery of its physical surroundings. He notes that the present trend is toward still further improvement in material welfare, in intellect, in goodness. He argues that the trend will continue in the same direction. He prophesies that humanity will eventually free itself completely from the physical difficulties of existence, over which it has already obtained partial victory. With no enemies or diseases to combat, and relieved from the struggle to obtain food, he looks forward to a race of philosophers, saints, scholars, artists. It is inspiring to contemplate Fiske's beautiful picture of the future. One is led to inquire how well founded such expectations are. It is easy to think of obstacles which may prevent their realization. To be sure, we have no reason to expect the destruction of humanity within several million years; yet there are dangerous possibilities in the nearer future such as may call a halt on further progress, or cause a return to savagery.

I propose to discuss individually some of the difficulties,—physical, biological, and sociological,—which mankind will have to overcome, if development is to continue in its present direction. I hope to show that the physical and biological difficulties are not likely to prove insurmountable. The sociological difficulties seem to me much more serious. "Man's worst enemy is man."

The principal physical difficulty is that arising from exhaustion of natural resources. Our civilization is extraordinarily complex. Our everyday life requires the use of materials that were scarcely known a hundred years ago. These materials exist in limited supplies, which are being exhausted. Imagine humanity suddenly deprived of coal at this moment. Nearly all machinery would stop; transportation by rail and steamboat would cease; the cities would face immediate famine; a large part of the population would be thrown out of employment; many comforts and necessities could not be obtained at all; there would be terrible suffering, with epidemics as its consequence; population would accordingly decrease, and civilization would receive a serious setback. Now the coal supply is not going to be cut off suddenly; but it is being exhausted gradually. At the present rate of consumption, a very few thousand years will suffice to deprive the world of coal. Nor is the time immeasurably distant when the supplies of petroleum, natural gas, and the various metals will be exhausted.

Yet the exhaustion of natural resources need not cause serious alarm, in the present state of scientific knowledge. Coal, oil, and gas are valuable, not in themselves, but only because they contain stores of energy that we are able to set free and use in the form of heat, mechanical power, or light. The energy of these fuels entered them originally as sunlight; and the sun's rays still bring us ample supplies of energy. It is true we have not yet devised commercially practical means of turning sunlight directly into the forms of energy that we need; but there is no scientific principle to forbid our doing so; the only thing needed is inventive ingenuity in matters of detail. Even now, the solar engines of Shuman, and of Willsie and Boyle, are all nearly if not quite commercially usable; and they will probably come into general use within our lifetime in sunny countries like Arizona or Egypt. Power and heat without coal can be obtained inexhaustibly from waterfalls; and much help can be secured in this manner; but the waterpower of the whole world is insufficient for the needs of mankind. A more promising development is that of the conversion of vegetable wastes into alcohol, a very valuable fuel. It can be produced just as crops are produced, as long as sunshine, moisture, and soil remain.

Nor is the outlook less hopeful with regard to the exhaustion of metallic resources. To be sure, we must not hope to devise means of making the metals out of more common substances, since they are chemical elements. For that very reason, however, they are indestructible. The wearing out of an iron rail, for instance, does not represent the destruction of the lost material, but merely the scattering of it as fine dust, or rust. Now it is undoubtedly a very difficult problem to recover such widely diffused material; yet there is no scientific principle to stand in the way of doing so. We can hardly doubt that future discovery and invention will find a practical solution to the problem. It is instructive, in this connection, to note the history of the gold industry. Fifty years ago much material containing a small amount of gold was discarded because the cost of extracting the gold was greater than its value. Now, with a better knowledge of chemistry, this same material is being worked over, and large profits obtained from the thinly diffused gold in it.

The exhaustion of agricultural soils presents a problem perhaps more serious, but probably no more difficult of solution. Just as with the metals, the problem is one of recovering the important elements of the soils, after they have been widely scattered; a difficult problem, admittedly, but not an insoluble one, since the solution is not opposed to any general scientific principle.

Altogether, there is no reason to fear the ruin of civilization through depletion of natural resources, inevitable as such depletion is. The solution of the difficulties lies within the potentialities of physics, chemistry, and engineering, as long as the chemical elements and energy can be obtained.

Nor does it seem likely that civilization will meet ruin in the next few thousand years through other changes in physical conditions. It has been suggested that with further cooling of the earth's interior, the water will sink into the profound depths, and all life will cease by drought. The loss of terrestrial heat, however, is exceedingly slow; and if this result occurs, it will be only after geologic ages, not within the next few thousand years.

That any catastrophic event will occur to wreck our civilization is not likely. To be sure, a stellar collision is possible; but as a matter of pure chance, it is not likely to come for many millions of years. Collisions of the earth with comets will probably occur, but be totally harmless, since there is reason to believe that a comet is merely a cloud of dust. As for earthquake, flood, or other catastrophe of terrestrial origin, science does not indicate anything that could cause world-wide disturbance.

Assuming that physical conditions remain suitable, humanity will still have to face dangers from its enemies among living things. Of these, the most important at the present time are the harmful bacteria. They are already fairly well under control; and it seems altogether improbable that any species of living thing now in existence will ever seriously threaten our civilization.

It remains to inquire whether any new species of a dangerous nature is likely to arise. A favorite flight for imagination of the Jules Verne type is one concerning conquest of the earth by beings from another planet. This idea is too chimerical to deserve more than passing mention. It will suffice to direct attention to the uncertainty as to the existence of living creatures on other planets; the stupendous physical difficulties of navigating the ether; the enormous time necessary to traverse interplanetary distances, even if cannon-ball speed could be attained; the difficulty of maintaining life under the physical conditions of outer space; and the improbability that creatures from another planet could live under the physical conditions obtaining on the earth.

Another idea sometimes advanced is that some animal superior to man will appear on earth and exterminate humanity, as man in his time exterminated the mastodon and cave-bear. But the doctrine of evolution does not admit the appearance of new species except by the gradual change of already existent species; and there is no animal now upon the earth which is at all near to reaching superiority over man. Nor does it seem probable that any inferior animal will so develop as to seriously menace civilization. The plague of locusts did not destroy Egyptian civilization, though the Egyptians were less able to combat insects than we are. The bacterial disease plagues of the Middle Ages, destructive as they were, did not seriously impede the progress of civilization. If new harmful bacterial species should appear in future, we can hardly doubt that the science of medicine will be able to cope with them. Altogether, the conquest of man by other living creatures is quite contrary to scientific probability. The progress of medicine has resulted in keeping alive many sickly persons, who would die under less civilized conditions. It has been suggested that this will result in enfeeblement of the general physique. One can imagine that such a tendency might end in decadence of the race through sheer physical weakness. But this idea is opposed by historical evidence. The keeping alive of sickly persons is no new thing, but has been accomplished in increasing degree as the science of medicine has progressed. Coincident with this development has been a decrease in the death rate. In the late sixteen-hundreds, it was eighty per cent per thousand people per year in London; now it is less than twenty. Then the average length of life in civilized countries was twenty years; now it is thirty-five. As the added years are those of adult vigor, our race must surely possess a greater total of physical strength than it did two centuries ago. Furthermore, the average of adult physical vigor is greater to-day than formerly, notwithstanding the common belief that men of former times were much stronger than at present. The natural but erroneous idea comes, no doubt, from reading ordinary history, which deals chiefly with achievements of the great, who were necessarily people of somewhat exceptional bodily vigor. But books which indicate the life of the common people in other ages give plenty of evidence of weakness and disease. Such is the case, for instance, with the Old and New Testaments, with Chaucer, with Boccaccio. The real fact is, that the average physical stamina of our race has improved with advance in medicine, despite the salvation of sickly individuals. This justifies expectation of still further improvement in the future. We shall be more dependent, perhaps, on the physician and sanitarian; but as long as the result is increased bodily vigor, we need hardly fear decadence of the race through physical weakness.

Dangers of new and unforseen nature may arise and threaten our race. While such possibility must be admitted, intelligent discussion cannot go into the totally unknown. So far as known dangers are concerned, I do not believe that there are any of a physical or biological nature which can prevent the realization of John Fiske's ideal of the destiny of man.

Unfortunately, man has an enemy much more dangerous to him than any force of nature, any ferocious beast, or any pestilence; an enemy which he cannot escape, cannot kill, and perhaps can never overcome. I refer to the fellow man; an enemy in fact, if not in spirit. This enemy may or may not encompass the destruction of humanity; that it will prevent the realization of John Fiske's ideal, I regard as possible; that it will remotely postpone such realization, by causing centuries of retrogression to follow the past few of advancement, I believe is probable. The grounds for this belief will occupy the remainder of this paper.

First, let it be noted that with all the progress of recent centuries, humanity is in a more unstable position than ever before. Just as an army, in occupying large new territory, becomes more vulnerable, so humanity, in pressing its conquest of the forces of nature, has reached a situation in which more loss can be caused by comparatively slight mishaps, than ever before. For one thing, our control over nature requires large quantities of capital. I use the word 'capital', of course, in the sense of agencies of production: tools, machinery, buildings, roads, supplies of material and the like. These things represent the accumulation of centuries. Let them be destroyed, and civilization would disappear; nor could it be restored soon, however much scientific knowledge might be available. Without capital, the productiveness of labor would shrink to almost nothing; and dense populations could no longer find sufficient food. All other activities would have to give place to the struggle for food. Education would stop, and present scientific knowledge would soon be lost.

Again, civilized nations have become more closely related than ever before. They adopt each other's inventions, laws, customs. Future developments will not affect single countries alone, but will affect all civilized humanity. If developments are bad, all civilization will have to suffer; not merely one country, as in previous times.

Finally, our present civilization requires very complicated organization. There are more interdependences between essentially disconnected activities than was formerly the case. A slight derangement of detail can now bring consequences out of all proportion. This was well illustrated three years ago, when the congestion of freight traffic resulted in a famine of coal in the northwest, and people burned fences and household furniture to keep from freezing. One such derangement necessarily causes others, and thus acts as a spark to start an explosion in the unstable structure of our civilization. With advancing civilization, the interdependences increase in number and importance.

With these considerations in mind, I propose to discuss five ways in which man may destroy his civilization, and start an era of retrogression. These are: warfare, misgovernment, degeneration of the stock, moral decadence, and over-population. One of these alone should suffice to cause a return to the Dark Ages, but two or more may act together.

As regards warfare, it is customary for leading men of all nations to express the view that warfare is at an end. It is also customary for them to act as if they expected war at any moment, by maintaining armaments and insisting on provisions for national defence. Since deeds count more than words, it is clear that the preponderance of competent opinion contemplates the continuance of warfare. A point of view resting on such ample authority may be accepted without further defence. It should be noted, further, that the nations of Europe are so entangled in treaties that when war arises between any two it will involve all the others. The recent policy of our own nation has been entirely in the direction of entanglement with foreign alliances.

And then we must consider the so-called "yellow peril". The unprogressive people of China, more numerous than those of

Western Europe and North America combined, have shown themselves able to purchase and use modern weapons with quite as deadly effect as the inventors and makers of the weapons. The Chinese value their lives lightly; they are superstitious enough to be imbued with the same sort of fanaticism which gave to the Saracens their conquest and destruction of more civilized nations. The future will aggravate the already serious points of conflict between white people and Chinese. Now, the only people who have contributed appreciably and independently to modern advancement are those of Western Europe, and their descendants in other parts of the world. Other peoples have merely imitated, but have not, in general, made independent progress. If, then, the nations of Western Europe, with the United States and Canada, are prostrated, it is safe to suppose that progress will give place to stagnation, if not retrogression. Such prostration will result, if they enter into general warfare among themselves, or combine in defence against the Chinese. The question as to who would win in a world-war is unimportant in this discussion. The important thing is the general destruction of capital and derangement of institutions. It took Germany two hundred and fifty years to recover from the religious wars of the seventeenth century. Our own South, in fifty years, has not regained the position of relative importance it enjoyed before the war between the States. A similar war involving all the civilized world would be far more disastrous. The ensuing prostrations would have to be counted by centuries. Meanwhile, advancement would cease.

In naming misgovernment as a possible agency of destruction, it was not intended to refer to mere aggravation of the terrible burdens already imposed by incompetence and extravagance of our rulers, but rather to the ruinous schemes of ignorant social reformers, which in the past have led to such disastrous experiments as the French Commune or the English Protectorate. Of such schemes the most threatening at present are those which propose to abolish individual differences. The former are represented by the socialists; the latter by the trades-unionists. The socialist programme, in abolishing the reward for thrift, would abolish thrift itself; no more capital would be accumulated; on the contrary, that already in existence would be allowed to decay; and with destruction of capital our material civilization would disappear. The trades-unionist programme, in proposing to reward the idle and inefficient equally with the industrious and efficient, removes all incentive to development of special ability. Without such incentive, invention and enterprise would cease; the production of wealth would be enormously decreased; progress would have to give place to retrogression. The remarkable growth of socialism and trades-unionism compels recognition of the probability that one or the other may enforce its principles on the civilized world. If such principles should remain in force, we should have a permanent return to barbarism. It is more likely that they would soon be cast aside in disgust, as was the system of the French first republic. But only a few years would suffice for the total derangements of the complex institutions of civilization and destruction of accumulated capital. The consequences of the destruction of capital have already been discussed, and reveal a situation from which centuries might be required to regain lost ground.

Supposing that civilization escapes these dangers, it may still fail through lack of proper people to maintain it. The history of tropical America has demonstrated the inability of negroes or Indians to maintain a high state of civilization, when furnished to them ready-made. That many white nations are equally incompetent, appears to follow from the retrogression of all countries which have fallen under Turkish or Arabic control, and from the decadence of Poland and Finland under the control of the barbaric though nominally Christian Russians. The nations which have shown themselves capable of advancing civilization count less than three hundred and fifty million inhabitants, or one-fifth the population of the earth. With increasing civilization, it has become customary for people, civilized and uncivilized, to move from one country to another. Accompanying these movements, a mixture of the races takes place, resulting in disappearance of the old stocks, and tending toward a hybrid stock of humanity, to which the lower types of to-day contribute the predominant part. If the higher types are completely absorbed by the lower, history indicates that the hybrid type would not advance in civilization, but rather would fall back into barbarism. Now we cannot doubt that the wandering of peoples of all kinds will greatly increase in the future. Racial antipathy has not prevented intermixture when different races occupy the same territory. And it is not necessary for people of different color to mix in order to lower the stock. Among the white nations we have Russians, Greeks, Syrians, and south Italians, none of whom have shown themselves competent to maintain a modern civilization. These people are coming in large numbers to the United States and to Western Europe. They have much larger families than Americans or Western Europeans. The whole trend of events is towards the absorption of the higher types of humanity by the lower; and therefore, toward disappearance of those human types which are competent to make progress.

There is another way in which the world may be deprived of people capable of advancing human progress. Civilization requires a moral as well as an intellectual standard. Human progress has placed in the hands of the masses more leisure and more money than formerly. These opportunities are used in large part for gross animal indulgence. The consumption of alcohol per capita is increasing. It would seem that more objectional carnal indulgences are increasing even faster. Religion has lost its hold. Progress has required the abandonment of certain religious superstitions; but the masses seem unable to accept this change without at the same time discarding the eternal truths of Christianity, in fact if not in profession. Unchecked indulgence in carnal pleasure has always resulted in general destruction of moral fibre, without which progress is impossible. Lacking the old-time restraints through poverty or religious belief, the present trend is toward decay of the moral stamina requisite for further advancement.

Finally, the continuance of advancement requires that men should have time and means for more than the mere acquirement of bare physical subsistence. Now the lower types of humanity always tend to multiply until their numbers are sufficient to consume all the food that can be produced by their utmost labor. When this condition is reached, advancement necessarily ceases. Probably over-population is responsible for the failure of the Chinese to continue the progress that they made in very early times. When the British assumed control of India, it was thought that the consequent relief from war, famine, and pestilence would enable the natives to make some advance in civilization; as a matter of fact, the effect was merely an enormous increase in population, on the same low scale of existence as formerly. The same tendencies have produced the slum populations of our large cities. Science is going to enable the world to support a larger population than ever before, but there is a limit. It is fixed by the rate at which the earth receives solar energy. If the population increases to the extreme limit, everybody will have to work all the time merely to produce a bare subsistence; and no time nor effort can be spent on making further progress. The whole human race would reach the stagnation of China.

I am well aware that it is not customary to take seriously the dangers just outlined. A fatuous optimism on such questions is the popular attitude. I think that if the optimists of to-day had lived in the time of Constantine, they would have had equal reason for believing that Roman civilization would never be destroyed. They would have noted that for centuries of the past, progress had continually been made; that the attacks of barbarians, which at one time seemed threatening, had been successfully repelled; the moral decadence following the ruin of the old mythology had been checked by the spread of Christianity. They would have argued, as they do to-day, that past progress indicates future progress; and that humanity would continue to improve until the millenium was attained. Nevertheless, Constantine's time was followed by an era of barbarism; and a thousand years of retrogression or stagnation intervened before progress was resumed. Can we hope that history will not repeat itself?

To sum up, it is maintained: First, that there is nothing in the physical or biological surroundings of mankind which is likely to forbid continued human progress; and, secondly, that there are numerous dangers of a sociological nature which are likely to cause serious interruption to progress. If such interruption should be caused by war, misgovernment, or moral decadence, it seems probable that progress would be resumed after a sufficiently long interval. But if caused by the degeneration of the stock, or by over-population, it is hard to see how humanity could ever extricate itself. In that case, John Fiske's grand ideal would never be realized.

JOHN R. BENTON.

University of Florida.